Unit 9
Day 1
Equations in Quadratic Form

1)

$$6x^4 - x^2 - 1 = 0$$

$$(3x^2 + 1)(2x^2 - 1) = 0$$

$3x^2 + 1 = 0$ | $2x^2 - 1 = 0$

$3x^2 = -1$ | $2x^2 = 1$

$x^2 = -\frac{1}{3}$ | $x^2 = \frac{1}{2}$

$x = \pm\sqrt{\frac{1}{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$ | $x = \pm\sqrt{\frac{1}{2}}$

$x = \pm\frac{\sqrt{3}}{3}$ | $x = \pm\frac{\sqrt{2}}{2}$

2)

$2x^4 + 5x^2 = 3$

$2x^4 + 5x^2 - 3 = 0$

$(2x^2 - 1)(x^2 + 3) = 0$

$2x^2 - 1 = 0$

$2x^2 = 1$

$x^2 = \frac{1}{2}$

$x = \pm\sqrt{\frac{1}{2}}$

$x = \pm\frac{\sqrt{2}}{2}$

$x^2 = -3$

$x = \pm i\sqrt{3}$

Solve by writing with positive exponents and multiplying through by the LCD.

3) $4p^{-2} - 8p^{-1} = 5$

$\left(\frac{4}{p^2} - \frac{8}{p} = 5\right) p^2$

$4 - 8p = 5p^2$

$0 = 5p^2 + 8p - 4$

$0 = (5p - 2)(p + 2)$

$p = \frac{2}{5}, p = -2$

4)

$$2(p^2+1)^{-2} - 5(p^2+1)^{-1} - 3 = 0$$

$$\left(\frac{2}{(p^2+1)^2} - \frac{5}{p^2+1} - 3 = 0\right)(p^2+1)^2$$

$$2 - 5(p^2+1) - 3(p^2+1)^2 = 0$$

let $y = p^2+1$

$$2 - 5y - 3y^2 = 0$$

$$3y^2 + 5y - 2 = 0$$

$$(3y-1)(y+2) = 0$$

$y = \frac{1}{3}$ | $y = -2$

$p^2+1 = \frac{1}{3}$ | $p^2+1 = -2$

$p^2 = -\frac{2}{3}$ | $p^2 = -3$

$p = \pm i\sqrt{3}$

$p = \pm i\sqrt{\frac{2}{3}}$

$p = \pm \frac{i\sqrt{6}}{3}$

Solve by substitution.

5) $\left(\frac{x}{x-2}\right)^2 - \frac{4x}{x-2} = 5$

let $y = \frac{x}{x-2}$

$\left(\frac{x}{x-2}\right)^2 - 4\left(\frac{x}{x-2}\right) = 5$

$y^2 - 4y = 5$

$y^2 - 4y - 5 = 0$

$(y-5)(y+1) = 0$

$y = 5 \quad y = -1$

$\frac{x}{x-2} = 5 \qquad \frac{x}{x-2} = -1$

$x = 5x - 10 \qquad x = -x + 2$

$-4x = -10 \qquad 2x = 2$

$x = \frac{5}{2} \qquad x = 1$

6) $\left(x^2-4\right)^2-\left(x^2-4\right)-6=0$

HOMEWORK:
EQ. IN QUAD FORM
PART A 1-16 ALL
PART B 1-15 ODD